UNITED STATES PATENT AND TRADEMARK OFFICE

NOTICE OF ALLOWANCE AND FEE(S) DUE

| 53184 | 7590 | 10/08/2009 |

i2 TECHNOLOGIES US, INC.
11701 LUNA ROAD
DALLAS, TX 75234

EXAMINER
CHOI, PETER H

ART UNIT	PAPER NUMBER
3623	

DATE MAILED: 10/08/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,725	12/04/2001	Narayan Venkatasubramanyan	020431.0884	1188

TITLE OF INVENTION: GENERATING A SUPPLY CHAIN PLAN

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1510	$0	$0	$1510	01/08/2010

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

| 53184 | 7590 | 10/08/2009 |

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11701 LUNA ROAD
DALLAS, TX 75234

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

_____ (Depositor's name)

_____ (Signature)

_____ (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,725	12/04/2001	Narayan Venkatasubramanyan	020431.0884	1188

TITLE OF INVENTION: GENERATING A SUPPLY CHAIN PLAN

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nonprovisional	NO	$1510	$0	$0	$1510	01/08/2010

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHOI, PETER H	3623	705-008000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____   Date _____

Typed or printed name _____   Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.   OMB 0651-0033   U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,725	12/04/2001	Narayan Venkatasubramanyan	020431.0884	1188

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53184	7590	10/08/2009	CHOI, PETER H

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Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 1146 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1146 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

	Application No.	Applicant(s)
Notice of Allowability	10/004,725	VENKATASUBRAMANYAN ET AL.
	Examiner	Art Unit
	PETER CHOI	3623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *6/24/09*.

2. ☐ The allowed claim(s) is/are *1, 4-8, 11-15, 18-23, 25-29, 31-35, 37-41, 43-64*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:
        1. ☐ Certified copies of the priority documents have been received.
        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the
            International Bureau (PCT Rule 17.2(a)).
    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .
    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of
        Paper No./Mail Date _____ .
    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)
1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
    Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
    Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____ .

/Jonathan G. Sterrett/
Primary Examiner, Art Unit 3623

DETAILED ACTION

EXAMINER'S AMENDMENT

1.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Steven Laureanti on September 24, 2009.

The application has been amended as follows:

1.   **(Currently Amended)** A computer-implemented method [[for]] of generating a

supply chain plan and using the supply chain plan to generate an order plan, comprising:

accessing, by a server, data in a database describing a supply chain network comprising a

plurality of buffers, each buffer configured to store a plurality of items and associated with a

corresponding time variable, the supply chain network constrained by a constraint; one or more

constraints selected from the group consisting of a lead time constraint, a lot size constraint, and a

capacity constraint;

generating, by the server, a linear programming problem for the supply chain network;

approximating, by the server, the linear programming problem by discretizing the

corresponding time variables of the buffers to yield a plurality of discretized corresponding time

variables and by relaxing the constraint one or more constraints to yield a relaxed constraint;

calculating, by the server, an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable and including a list of producers configured to supply the items to each buffer; and

adjusting, by the server, the optimized supply chain plan to satisfy the ~~constraint,~~ one or more constraints, wherein adjusting the optimized supply chain plan comprises:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

sorting the list of producers in order of preference according to the optimized supply chain plan and the amount of items across a time horizon that each producer may be able to supply;

selecting a producer from the list;

determining whether the producer selected is capable of producing all, some, or none of the quantity of items at the buffer;

adjusting one of (a) the quantity of items at the selected buffer, and (b) at least one time value of the corresponding time variable of the selected buffer, to satisfy the ~~constraint;~~ one or more constraints; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

determining whether there is a remaining quantity of items to be produced;

deciding whether to delay delivery or delay planning to the next buffer based on the determining whether there is a remaining quantity of items to be produced and delaying planning of the remaining quantity until a next buffer or delay delivery in accordance with the decision;

determining whether there is a next downstream buffer;

planning production to either (a) supply the items to the selected buffer at the adjusted time value, or (b) supply the adjusted quantity of items to the selected buffer; and

proceeding to a next downstream buffer; and

generating, by the server, an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer.

2-3.   **(Canceled)**

4.   **(Currently Amended)** The method of Claim 1, wherein adjusting the optimized supply chain plan comprises adjusting at least one time value of a corresponding time variable of at least one buffer to satisfy [[a]] the lead time constraint.

5.   **(Previously Presented)** The method of Claim 1, wherein adjusting the optimized

supply chain plan comprises adjusting at least one time value of a corresponding time variable of at

least one buffer to satisfy a feasible time constraint.

6.   **(Currently Amended)** The method of Claim 1, wherein adjusting the optimized

supply chain plan comprises adjusting a quantity of items of at least one buffer to satisfy [[a]] the lot

size constraint.

7.   **(Currently Amended)** The method of Claim 1, wherein adjusting the optimized

supply chain plan comprises adjusting a quantity of items of at least one buffer to satisfy [[a]] the

capacity constraint.

8.   **(Currently Amended)** A system [[for]] of generating a supply chain plan and

using the supply chain plan to generate an order plan, comprising:

a database configured to store data describing a supply chain network comprising a plurality

of buffers, each buffer configured to store a plurality of items and associated with a corresponding

time variable, the supply chain network constrained by a ~~constraint~~ one or more constraints selected

from the group consisting of a lead time constraint, a lot size constraint, and a capacity constraint;

a linear programming optimizer coupled with the database and configured to:

generate a linear programming problem for the supply chain network;

approximate the linear programming problem by discretizing the corresponding time variables of the buffers to yield a plurality of discretized corresponding time variables and by relaxing the ~~constraint~~ one or more constraints to yield a relaxed constraint; and

calculate an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable and including a list of producers configured to supply the items to each buffer; and

a heuristic solver coupled with the database and configured to adjust the optimized supply chain plan to satisfy the ~~constraint,~~ one or more constraints, wherein the heuristic solver is configured to adjust the optimized supply chain plan by:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

sorting the list of producers in order of preference according to the optimized supply chain plan and the amount of items across a time horizon that each producer may be able to supply;

selecting a producer from the list;

determining whether the producer selected is capable of producing all, some, or none of the quantity of items at the buffer;

adjusting one of (a) the quantity of items at the selected buffer, and (b) at least one time value of the corresponding time variable of the selected buffer to satisfy the ~~constraint;~~ one or more constraints; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

determining whether there is a remaining quantity of items to be produced;

deciding whether to delay delivery or delay planning to the next buffer based on the determining whether there is a remaining quantity of items to be produced and delaying planning of the remaining quantity until a next buffer or delay delivery in accordance with the decision;

determining whether there is a next downstream buffer;

planning production to either (a) supply the items to the selected buffer at the adjusted time value, or (b) supply the adjusted quantity of items to the selected buffer; and

proceeding to a next downstream buffer; and

an order planner coupled with the database and configured to generate an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer.

9-10.   **(Canceled)**

11.   **(Currently Amended)** The system of Claim 8, wherein the heuristic solver is configured to adjust the optimized supply chain plan by adjusting at least one time value of a corresponding time variable of at least one buffer to satisfy [[a]] the lead time constraint.

12.   **(Previously Presented)** The system of Claim 8, wherein the heuristic solver is configured to adjust the optimized supply chain plan by adjusting at least one time value of a corresponding time variable of at least one buffer to satisfy a feasible time constraint.

13.   **(Currently Amended)** The system of Claim 8, wherein the heuristic solver is configured to adjust the optimized supply chain plan by adjusting a quantity of items of at least one buffer to satisfy [[a]] the lot size constraint.

14.   **(Currently Amended)** The system of Claim 8, wherein the heuristic solver is configured to adjust the optimized supply chain plan by adjusting a quantity of items of at least one buffer to satisfy [[a]] the capacity constraint.

15.   **(Currently Amended)** Logic for generating a supply chain plan and using the supply chain plan to generate an order plan, the logic encoded in a computer-readable medium and when executed by a computer configured to:

access data describing a supply chain network comprising a plurality of buffers, each buffer configured to store a plurality of items and associated with a corresponding time variable, the supply

chain network constrained by a ~~constraint~~ one or more constraints selected from the group consisting of a lead time constraint, a lot size constraint, and a capacity constraint;

generate a linear programming problem for the supply chain network;

approximate the linear programming problem by discretizing the corresponding time variables of the buffers to yield a plurality of discretized corresponding time variables and by relaxing the ~~constraint~~ one or more constraints to yield a relaxed constraint;

calculate an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable and including a list of producers configured to supply the items to each buffer; and

adjust the optimized supply chain plan to satisfy the ~~constraint,~~ one or more constraints, the logic configured to adjust the optimized supply chain plan by:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

sorting the list of producers in order of preference according to the optimized supply chain plan and the amount of items across a time horizon that each producer may be able to supply;

selecting a producer from the list;

determining whether the producer selected is capable of producing all, some, or none of the quantity of items at the buffer;

adjusting one of (a) the quantity of items at the selected buffer, and (b) at least one time value of the corresponding time variable of the selected buffer, to satisfy the constraint; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

determining whether there is a remaining quantity of items to be produced;

deciding whether to delay delivery or delay planning to the next buffer based on the determining whether there is a remaining quantity of items to be produced and delaying planning of the remaining quantity until a next buffer or delay delivery in accordance with the decision;

determining whether there is a next downstream buffer;

planning production to either (a) supply the items to the selected buffer at the adjusted time value, or (b) supply the adjusted quantity of items to the selected buffer; and

proceeding to a next downstream buffer; and

generate an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer.

16-17. **(Canceled)**

18.   **(Currently Amended)** The logic of Claim 15, the logic configured to adjust the optimized supply chain plan by adjusting at least one time value of a corresponding time variable of at least one buffer to satisfy [[a]] the lead time constraint.

19.   **(Previously Presented)** The logic of Claim 15, the logic configured to adjust the optimized supply chain plan by adjusting at least one time value of a corresponding time variable of at least one buffer to satisfy a feasible time constraint.

20.   **(Currently Amended)** The logic of Claim 15, the logic configured to adjust the optimized supply chain plan by adjusting a quantity of items of at least one buffer to satisfy [[a]] the lot size constraint.

21.   **(Currently Amended)** The logic of Claim 15, the logic configured to adjust the optimized supply chain plan by adjusting a quantity of items of at least one buffer to satisfy [[a]] the capacity constraint.

22.   **(Currently Amended)** A system for generating a supply chain plan and using the supply chain plan to generate an order plan, comprising:

means for accessing data describing a supply chain network comprising a plurality of buffers, each buffer configured to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a ~~constraint~~ one or more constraints selected from the group consisting of a lead time constraint, a lot size constraint, and a capacity constraint;

means for generating a linear programming problem for the supply chain network;

means for approximating the linear programming problem by discretizing the corresponding time variables of the buffers to yield a plurality of discretized corresponding time variables and by relaxing the ~~constraint~~ one or more constraints to yield a relaxed constraint;

means for calculating an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable and including a list of producers configured to supply the items to each buffer; and

means for adjusting the optimized supply chain plan to satisfy the ~~constraint,~~ one or more constraints, wherein adjusting the optimized supply chain plan comprises:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

sorting the list of producers in order of preference according to the optimized supply chain plan and the amount of items across a time horizon that each producer may be able to supply;

selecting a producer from the list;

determining whether the producer selected is capable of producing all, some, or none of the quantity of items at the buffer;

adjusting one of (a) the quantity of items at the selected buffer, and (b) at least one time value of the corresponding time variable of the selected buffer, to satisfy the constraint; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

determining whether there is a remaining quantity of items to be produced;

deciding whether to delay delivery or delay planning to the next buffer based on the determining whether there is a remaining quantity of items to be produced and delaying planning of the remaining quantity until a next buffer or delay delivery in accordance with the decision;

determining whether there is a next downstream buffer;

planning production to either (a) supply the items to the selected buffer at the adjusted time value, or (b) supply the adjusted quantity of items to the selected buffer; and

proceeding to a next downstream buffer; and

means for generating an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer.

23.   **(Currently Amended)** A computer-implemented method [[for]] of generating a supply chain plan and using the supply chain plan to generate an order plan, comprising:

accessing, by a server, data in a database describing a supply chain network comprising a plurality of buffers, each buffer configured to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a plurality of constraint one or more constraints selected from the group consisting of a lead time constraint, a lot size constraint, and a capacity constraint;

generating, by the server, a linear programming problem for the supply chain network;

approximating, by the server, the linear programming problem by discretizing the corresponding time variables of the buffers to yield a plurality of discretized corresponding time variables and by relaxing the ~~constraint~~ one or more constraints to yield a plurality of relaxed constraints;

calculating, by the server, an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable and including a list of producers configured to supply the items to each buffer;

generating, by the server, an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer; and

adjusting, by the server, the optimized supply chain plan to satisfy the ~~constraint,~~ one or more constraints, by repeating the following until a last upstream buffer is reached:

selecting a buffer, adjusting at least one time value of the corresponding time variable of the selected buffer to satisfy [[a]] the lead time constraint, adjusting the quantity of items at the selected buffer to satisfy [[a]] the lot size constraint, and proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer, planning production to supply the adjusted quantity of items to the selected buffer at the adjusted time value, and proceeding to a next downstream buffer.

24.   **(Canceled)**

25.   **(Previously Presented)** The method of Claim 1, wherein generating the order plan comprises repeating the following until a last upstream buffer is reached:

selecting a buffer that requires a quantity of items;

planning production to supply the quantity of items to the selected buffer using at least some of the producers from the list of producers associated with the buffer; and

proceeding to a next upstream buffer.

26.   **(Previously Presented)** The method of Claim 1, wherein generating the order plan comprises repeating the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the items to the buffer using the producer;

determining a remaining quantity of items required by the buffer; and

proceeding to a next producer on the list.

27.   **(Previously Presented)** The method of Claim 1, wherein generating the order plan comprises repeating the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the quantity of items to the buffer using the

producer;

proceeding to a next producer on the list if there is a next producer; and

planning production regardless of the list if there is no next producer.

28.   **(Previously Presented)** The method of Claim 1, wherein generating the order plan

comprises repeating the following if a quantity of items cannot be supplied to a buffer by a deadline,

until the quantity of items for the buffer is planned:

selecting a producer from the list of producers associated with the buffer, the producers

configured to supply the items to the buffer after the deadline;

planning production to supply at least some of the quantity of items to the buffer using the

selected producer; and

proceeding to a next producer on the list.

29.   **(Previously Presented)** The method of Claim 1, wherein generating the order plan

comprises repeating the following if a quantity of items cannot be supplied to a buffer by a deadline,

until the quantity of items for the buffer is planned:

selecting a supply time according to the list of producers associated with the buffer, the producers configured to supply the items to the buffer at one or more supply times after the deadline;

planning production to supply at least some of the quantity of items to the buffer using a producer configured to supply the items at the selected supply time; and

proceeding to a next supply time.

30.   **(Canceled)**

31.   **(Previously Presented)** The system of Claim 8, wherein the order planner is configured to repeat the following until a last upstream buffer is reached:

selecting a buffer that requires a quantity of items;

planning production to supply the quantity of items using at least some of the producers from the list of producers associated with the buffer; and

proceeding to a next upstream buffer.

32.   **(Previously Presented)** The system of Claim 8, wherein the order planner is configured to repeat the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer; planning production to supply at least some of the items to the buffer using the producer;

determining a remaining quantity of items required by the buffer; and proceeding to a next producer on the list.

33.   **(Previously Presented)** The system of Claim 8, wherein the order planner is configured to repeat the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the quantity of items to the buffer using the producer;

proceeding to a next producer on the list if there is a next producer; and

planning production regardless of the list if there is no next producer.

34.   **(Previously Presented)** The system of Claim 8, wherein the order planner is configured generate the order plan by repeating the following if a quantity of items cannot be supplied to a buffer by a deadline, until the quantity of items for the buffer is planned:

selecting a producer from the list of producers associated with the buffer, the producers configured to supply the items to the buffer after the deadline;

planning production to supply at least some of the quantity of items to the buffer using the

selected producer; and

proceeding to a next producer on the list.

35.   **(Previously Presented)** The system of Claim 8, wherein the order planner is

configured to generate the order plan by repeating the following if a quantity of items cannot be

supplied to a buffer by a deadline, until the quantity of items for the buffer is planned:

selecting a supply time according to the list of producers associated with the buffer, the

producers configured to supply the items to the buffer at one or more supply times after the

deadline;

planning production to supply at least some of the quantity of items to the buffer using the

producer configured to supply the items at the selected supply time; and

proceeding to a next supply time.

36.   **(Canceled)**

37.   **(Previously Presented)** The logic of Claim 15, the logic configured to generate the

order plan by repeating the following until a last upstream buffer is reached:

selecting a buffer that requires a quantity of items;

planning production to supply the quantity of items to the selected buffer using at least some of the producers from the list of producers associated with the buffer; and

proceeding to a next upstream buffer.

38.   **(Previously Presented)** The logic of Claim 15, the logic configured to generate the order plan by repeating the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the items to the buffer using the producer;

determining a remaining quantity of items required by the buffer; and

proceeding to a next producer on the list.

39.   **(Previously Presented)** The logic of Claim 15, the logic configured to generate the order plan by repeating the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the quantity of items to the buffer using the producer;

proceeding to a next producer on the list if there is a next producer; and

planning production regardless of the list if there is no next producer.

40.   **(Previously Presented)** The logic of Claim 15, the logic configured to generate the

order plan by repeating the following if a quantity of items cannot be supplied to a buffer by a

deadline, until the quantity of items for the buffer is planned:

selecting a producer from the list of producers associated with the buffer, the producers

configured to supply the items to the buffer after the deadline;

planning production to supply at least some of the quantity of items to the buffer using the

selected producer; and

proceeding to a next producer on the list.

41.   **(Previously Presented)** The logic of Claim 15, the logic configured to generate the

order plan by repeating the following if a quantity of items cannot be supplied to a buffer by a

deadline, until the quantity of items for the buffer is planned:

selecting a supply time according to the list of producers associated with the buffer, the

producers configured to supply the items to the buffer at one or more supply times after the

deadline;

planning production to supply at least some of the quantity of items to the buffer using a

producer configured to supply the items at the selected supply time; and

proceeding to a next supply time.

42.   **(Canceled)**

43.   **(Previously Presented)** The method of claim 23, wherein generating the order plan comprises repeating the following until production to supply a quantity of items to a buffer is planned:

      selecting a producer from the list of producers associated with the buffer, planning production to supply at least some of the items to the buffer using the producer, determining a remaining quantity of items required by the buffer, and proceeding to a next producer on the list.

44.   **(New)** The method of Claim 1, further comprising planning production and removing the selected producer from the list if it is determined that the selected producer is capable of producing all of the quantity of items at the buffer.

45.   **(New)** The method of Claim 1, further comprising determining whether there is a next producer if it is determined that the selected producer is capable of producing none of the quantity of items at the buffer.

46.   **(New)** The method of Claim 1, further comprising planning partial production and updating the quantity of items at the buffer to reflect a partial quantity provided by the

selected producer if it is determined that the selected producer is capable of producing some of the quantity of items at the buffer.

47.   **(New)** The method of Claim 1, further comprising, if it is determined that the selected producer is capable of producing some or none of the quantity of items at the buffer, performing the acts comprising:

determining whether there is a next producer on the list; and

if it is determined that there is a next producer on the list, selecting the next producer.

48.   **(New)** The method of Claim 1, further comprising, if it is determined that the selected producer is capable of producing some or none of the quantity of items at the buffer, performing the acts comprising:

determining whether there is a next producer on the list wherein:

if it is determined that there is a not a next producer on the list, performing the acts comprising:

generating a list of producers that is sorted in order of preference and chronological order;

selecting a producer from the list;

planning production to satisfy one or more constraints using the selected producer; and

determining whether all items have been produced wherein:

if it is determined that all items have been produced, determining

whether there is a next buffer; and

if it is determined that less than all items have been produced,

determining whether there is a next producer on the list and performing

the acts comprising:

selecting the next producer and determining whether there

is a next buffer if it is determined that there is a next producer; and

determining whether there is a next buffer if it is

determined that there is not a next producer on the list.

49.   **(New)** The method of Claim 1, further comprising:

generating a list of producers that is sorted in order of preference and chronological

order, the list describing the producers and supply times at which the producers may provide

items to the buffer;

selecting a supply time from the list;

planning production to satisfy one or more constraints using a producer capable of

supplying items at the selected supply time; and

determining whether all items have been produced wherein:

if it is determined that all items have been produced, determining whether there is

a next buffer; and

if it is determined that less than all items have been produced, determining

whether there is a next supply time on the list wherein:

if it is determined that there is a next supply time on the list, selecting a next supply time and determining whether there is a next buffer; and

if it is determined that there is not a next supply time on the list, determining whether there is a next buffer.

50.   **(New)** The method of Claim 1, further comprising:

generating the order plan regardless of supply chain recommendations; and

determining whether there is a next buffer.

51.   **(New)** The system of Claim 8, wherein the heuristic solver is further configured to adjust the optimized supply chain plan by planning production and removing the selected producer from the list if it is determined that the selected producer is capable of producing all of the quantity of items at the buffer.

52.   **(New)** The system of Claim 8, wherein the heuristic solver is further configured to adjust the optimized supply chain plan by determining whether there is a next producer if it is determined that the selected producer is capable of producing none of the quantity of items at the buffer.

53.   **(New)** The system of Claim 8, wherein the heuristic solver is further configured to adjust the optimized supply chain plan by planning partial production and updating the quantity of items at the buffer to reflect a partial quantity provided by the selected producer if it

is determined that the selected producer is capable of producing some of the quantity of items at the buffer.

54.   **(New)** The system of Claim 8, wherein the heuristic solver is further configured to adjust the optimized supply chain plan if it is determined that the selected producer is capable of producing some or none of the quantity of items at the buffer, by performing the acts comprising:

    determining whether there is a next producer on the list; and

    if it is determined that there is a next producer on the list, selecting the next producer.

55.   **(New)** The system of Claim 8, wherein the heuristic solver is further configured to adjust the optimized supply chain plan if it is determined that the selected producer is capable of producing some or none of the quantity of items at the buffer, by performing the acts comprising:

    determining whether there is a next producer on the list wherein:

        if it is determined that there is a not a next producer on the list, performing the acts comprising:

            generating a list of producers that is sorted in order of preference and chronological order;

            selecting a producer from the list;

            planning production to satisfy one or more constraints using the selected producer; and

determining whether all items have been produced wherein:

if it is determined that all items have been produced, determining whether there is a next buffer; and

if it is determined that less than all items have been produced, determining whether there is a next producer on the list and performing the acts comprising:

selecting the next producer and determining whether there is a next buffer if it is determined that there is a next producer; and

determining whether there is a next buffer if it is determined that there is not a next producer on the list.

56.   **(New)** The system of Claim 8, wherein the heuristic solver is further configured to adjust the optimized supply chain plan by:

generating a list of producers that is sorted in order of preference and chronological order, the list describing the producers and supply times at which the producers may provide items to the buffer;

selecting a supply time from the list;

planning production to satisfy one or more constraints using a producer capable of supplying items at the selected supply time; and

determining whether all items have been produced wherein:

if it is determined that all items have been produced, determining whether there is a next buffer; and

if it is determined that less than all items have been produced, determining whether there is a next supply time on the list wherein:

if it is determined that there is a next supply time on the list, selecting a next supply time and determining whether there is a next buffer; and

if it is determined that there is not a next supply time on the list, determining whether there is a next buffer.

57.   (New) The system of Claim 8, wherein the heuristic solver is further configured to adjust the optimized supply chain plan by:

generating the order plan regardless of supply chain recommendations; and

determining whether there is a next buffer.

58.   (New) The logic of Claim 15, further configured to adjust the optimized supply chain plan by planning production and removing the selected producer from the list if it is determined that the selected producer is capable of producing all of the quantity of items at the buffer.

59.   (New) The logic of Claim 15, further configured to adjust the optimized supply chain plan by determining whether there is a next producer if it is determined that the selected producer is capable of producing none of the quantity of items at the buffer.

60.   (New) The logic of Claim 15, further configured to adjust the optimized supply chain plan by planning partial production and updating the quantity of items at the buffer to

reflect a partial quantity provided by the selected producer if it is determined that the selected producer is capable of producing some of the quantity of items at the buffer.

61.   **(New)** The logic of Claim 15, further configured to adjust the optimized supply chain plan if it is determined that the selected producer is capable of producing some or none of the quantity of items at the buffer, by performing the acts comprising:

   determining whether there is a next producer on the list; and

   if it is determined that there is a next producer on the list, selecting the next producer.

62.   **(New)** The logic of Claim 15, further configured to adjust the optimized supply chain plan if it is determined that the selected producer is capable of producing some or none of the quantity of items at the buffer, by performing the acts comprising:

   determining whether there is a next producer on the list wherein:

      if it is determined that there is a not a next producer on the list, performing the acts comprising:

         generating a list of producers that is sorted in order of preference and chronological order;

         selecting a producer from the list;

         planning production to satisfy one or more constraints using the selected producer; and

         determining whether all items have been produced wherein:

if it is determined that all items have been produced, determining

whether there is a next buffer; and

if it is determined that less than all items have been produced,

determining whether there is a next producer on the list and performing

the acts comprising:

selecting the next producer and determining whether there

is a next buffer if it is determined that there is a next producer; and

determining whether there is a next buffer if it is

determined that there is not a next producer on the list.

63.   **(New)** The logic of Claim 15, further configured to adjust the optimized supply
chain plan by:

generating a list of producers that is sorted in order of preference and chronological
order, the list describing the producers and supply times at which the producers may provide
items to the buffer;

selecting a supply time from the list;

planning production to satisfy one or more constraints using a producer capable of
supplying items at the selected supply time; and

determining whether all items have been produced wherein:

if it is determined that all items have been produced, determining whether there is
a next buffer; and

if it is determined that less than all items have been produced, determining
whether there is a next supply time on the list wherein:

if it is determined that there is a next supply time on the list, selecting a
next supply time and determining whether there is a next buffer; and

if it is determined that there is not a next supply time on the list,
determining whether there is a next buffer.

64.   **(New)** The logic of Claim 15, further configured to adjust the optimized supply chain plan by:

generating the order plan regardless of supply chain recommendations; and

determining whether there is a next buffer.

2.   The following is an examiner's statement of reasons for allowance:

Neither nor any of the prior art of record, taken individually or in any combination, fairly teach, inter alia, the combination of the steps of:

accessing, by a server, data in a database describing a supply chain network comprising a plurality of buffers, each buffer configured to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by one or more constraints selected from the group consisting of a lead time constraint, a lot size constraint, and a capacity constraint;

generating, by the server, a linear programming problem for the supply chain network;

approximating, by the server, the linear programming problem by discretizing the corresponding time variables of the buffers to yield a plurality of discretized corresponding time variables and by relaxing the one or more constraints to yield a relaxed constraint;

calculating, by the server, an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of

items at each buffer for at least one time value of the corresponding time variable and including a list of producers configured to supply the items to each buffer; and

adjusting, by the server, the optimized supply chain plan to satisfy the one or more constraints, wherein adjusting the optimized supply chain plan comprises:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

sorting the list of producers in order of preference according to the optimized supply chain plan and the amount of items across a time horizon that each producer may be able to supply;

selecting a producer from the list;

determining whether the producer selected is capable of producing all, some, or none of the quantity of items at the buffer;

adjusting one of (a) the quantity of items at the selected buffer, and (b) at least one time value of the corresponding time variable of the selected buffer, to satisfy the one or more constraints; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

determining whether there is a remaining quantity of items to be produced;

deciding whether to delay delivery or delay planning to the next buffer based on the determining whether there is a remaining quantity of items to be produced and delaying planning of the remaining quantity until a next buffer or delay delivery in accordance with the decision;

determining whether there is a next downstream buffer;

planning production to either (a) supply the items to the selected buffer at the adjusted time value, or (b) supply the adjusted quantity of items to the selected buffer; and

proceeding to a next downstream buffer; and

generating, by the server, an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer.

Kennedy et al., the closest art of record, does not explicitly teach the steps of sorting the list of producers in order of preference according to the optimized supply chain plan and the amount of items across a time horizon that each producer may be able to supply, selecting a producer from the list, determining whether the producer selected is capable of producing all, some, or none of the quantity of items at the buffer, selecting a buffer, determining whether there is a remaining quantity of items to be produced, and deciding whether to delay delivery or delay planning to the next buffer based on the determining whether there is a remaining quantity of items to be produced

and delaying planning of the remaining quantity until a next buffer or delay delivery in

accordance with the decision.

Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to PETER CHOI whose telephone number is (571)272-

6971. The examiner can normally be reached on M-F 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Beth Boswell can be reached on (571) 272-6737. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. C./
Examiner, Art Unit 3623
        /Jonathan G. Sterrett/
        Primary Examiner, Art Unit 3623